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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/972,855	10/10/2001	Yoshiaki Sugizaki	04329.2686	5564

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Finnegan, Henderson, Farabow
Garrett & Dunner, L.L.P.
1300 I Street, N.W.
Washingon, DC 20005-3315

EXAMINER	
IM, JUNGHWA M	
ART UNIT	PAPER NUMBER
2811	

DATE MAILED: 11/21/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application N .	Applicant(s)	
	09/972,855	SUGIZAKI, YOSHIAKI	
	Examiner	Art Unit	
	Junghwa M. Im	2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Peri d f r Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 September 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) *1,2,4-11 and 14-18* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *3, 12, 13, 19 and 20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *4 and 5* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Election/Restrictions

Applicant's election of Embodiment 24 of Figure 24, Claims 3, 12, 13, 19 and 20 in Paper No.7 is acknowledged.

The traversal is based on the ground that the search and examination of 28 embodiments of the entire application can be made without serious burden.

This is not found persuasive since examining of each distinctive embodiment requires a separate, individual search. Thus, examining entire embodiments is in fact an added burden.

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 3, 12, 13 19 and 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

First, the specification page 13, lines 3-8, discloses "a semiconductor element" recited in claims as an internal circuit built in a wiring substrate in Fig. 1. However, elected claims readable on Fig. 24 recite a semiconductor element on the first semiconductor chip. Then, does it intend to mean a wiring formation as a semiconductor element? The term "semiconductor element" is not clear.

Second, claim 19 recites a conductive bump is "configured" to connect to a part of connecting terminals. With a disclosure on page12, line 8, that a conductive bump is a connecting terminal, this claim limitation does not make sense. Is a "conductive bump" the same thing as a "conducting terminal", or something different?

Claim Rejections - 35 USC § 102

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 3, 12, 13 and 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Sakui et al. (U.S. Pat. No. 6,239,495).

Regarding claim 3, in so far as understood, Sakui et al. show in Fig. 1 a semiconductor device comprising;

a first semiconductor chip 1-2 where a semiconductor element 3 is formed;

a plurality of first connecting terminals 8 arranged on a semiconductor element formation surface side in the first semiconductor chip 1-2, and connected electrically to the semiconductor element 3;

conductive members 4 buried in a plurality of through holes 5 that go through the first semiconductor 1-2 coupled to the second 1-1 to n-th semiconductor chips (12-4 in Fig. 3). Second connecting terminals on the back of the first chip are shown at 8-1, 8-2, ... in Fig. 3. The chips are mounted on an assembly board (col. 5, lines 25-33, col. 1 lines 62-63).

Also see the respective portions of the specification such as col. 4, lines 60-66.

Regarding claim 12, Sakui et al. show in Fig. 1, the semiconductor further comprising a second semiconductor chip 1-1 stacked on the first semiconductor chip 1-2, wherein at least portion of the connecting terminals 8 arranged on a stacked surface between the first semiconductor chip 1-2 and the second semiconductor chip of the first connecting terminals and the second connecting terminals in the first semiconductor chip is coupled to the second semiconductor chip (col. 4, line 58- col. 5, line 12).

Regarding claim 13, Sakui et al. show in Fig. 3, the semiconductor further comprising a second to an n-th (wherein n is a positive integer of three or more) semiconductor chips stacked above first semiconductor chip, wherein at least portion of the connecting terminals arranged on a stacked surface between the first semiconductor chip and the second semiconductor chip of the first connecting terminals and the second connecting terminals in the first semiconductor chip is coupled to the second to n-th semiconductor chip.

Regarding the specific connections between the chips, see the respective portions of the specification, for example, from col. 5, line 30 to col. 6, line 9.

Regarding claim 19, in so far as understood, Sakui et al. show in Fig. 1 and Fig.3, the semiconductor further comprising a conductive bump configured to connect at least portion of

the plurality of connecting terminals of the semiconductor chips to be stacked with each other (col. 3, line 45 - col. 6, line 9).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sakui et al. in view of Hsuan et al. (U.S. Pat. No. 6,236,109).

Regarding claim 20, Sakui et al. show in Figures 1 and 3, a semiconductor device comprising;

a first semiconductor chip 1-2 where a semiconductor element 3 is formed;

a first connecting terminal 8 arranged on a semiconductor element formation 3 surface side in the first semiconductor chip 1-2, and connected electrically to the semiconductor element;

a conductive member 4 buried in a through hole 5 that goes through the first semiconductor chip 1-2;

a second connecting terminal 8-1 arranged on a back surface side of the semiconductor element formation in the first semiconductor chip, and connected electrically to the semiconductor element via the conductive member 4 in 1-2;

a second semiconductor chip 1-1 stacked on the first semiconductor chip 1-2;

a third connecting terminal (a third bump on 12-2) arranged on a semiconductor element formation surface side in the second semiconductor chip12-2;

wherein, one of the first connecting terminal and the second connecting terminal of the semiconductor chip is arranged at a position facing to the third connecting terminal of the second semiconductor chip, the first semiconductor chip and the second semiconductor chip are electrically coupled with each other through the facing connecting terminals (col. 4, line 58 – col. 5, line 12).

Sakui et al do not disclose the limitation over the size of the first and second chips.

However, Hsuan et al. show in Fig. 6A a multi-chip packaging device wherein the second semiconductor chip is larger than the first semiconductor chip.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teaching of Hsuan et al. to the device of Sakui et al. to have a larger second chip connected to a smaller first chip since such an arrangement improves the effect of heat dissipation during installation, thus controlling the chip connection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Junghwa M. Im whose telephone number is (703) 305-3998. The examiner can normally be reached on MON.-FRI. 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (703) 308-2772. The fax phone numbers for the

organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

JMI
November 17, 2002

Sara W Crane

Sara Crane
Primary Examiner